


## What is Claimed is:

- [c1]  Switching module comprising:
- a first receiver which stores a first plurality of data packets;
  - a second receiver which stores a second plurality of data packets;
  - a first output which outputs a first subset of the first plurality of data packets and the second plurality of data packets;
  - a second output which outputs a second subset of the first plurality of data packets; and
  - a switch coupled to the first receiver and the second receiver and coupled to the first output and the second output for routing the first subset and the second subset to the respective first or second output.
- [c2] The switching module of claim 1, wherein the first receiver further comprises a set of 'm' data-in circuits for receiving the first plurality of data packets from a plurality of LAN adapters, each data-in further comprising: a
- first memory for storing the first subset of said first plurality of data packets, and a second memory for storing the second subset of said first plurality of data packets; and
  - a selector for sending each received frame of said first plurality of data packets either to the first memory or the second memory.
- [c3] The switching module of claim 2, wherein the data packets are sized as ATM data packets, each data packet further comprising an additional byte to define the final destination of said data packet, said additional byte including a module bit configuration to determine in which of said first or second memory the data packet is to be stored.
- [c4] The switching module of claim 3, wherein the first output further comprises a set of 'p' data-out circuits for receiving the first subset of said first plurality of data packets and the second plurality of data packets, and wherein the switch further comprises a controller for configuring at each time period a plurality of address lines to route the first subset of said first plurality of data packets and the second plurality of data packets to the appropriate data-out circuit according to the additional byte configuration.

- [c5] The switching module of claim 2, wherein the second output further comprises a set of 'n' expansion data-out circuits for receiving the second subset of said first plurality of data packets, each expansion data-out circuit further comprising:  
storage for storing the second subset of said first plurality of data packets received from the corresponding data-in circuit.
- [c6] The switching module of claim 1 further comprising an address configurator for predefining the address of the switch module.
- [c7] The switching module of claim 6, wherein the address of the switch module is a bit configuration to be compared to the module bit configuration of each incoming data packet.
- [c8] A switching structure comprising two switching modules wherein the first and second switching modules comprise a first receiver which stores a first plurality of data packets, a second receiver which stores a second plurality of data packets, a first output which outputs a first subset of the first plurality of data packets and the second plurality of data packets, a second output which outputs a second subset of the first plurality of data packets, and a switch coupled to the first receiver and the second receiver and coupled to the first output and the second output for routing the first subset and the second subset to the respective first or second output, and wherein a first expansion data-out circuit of the first switching module is connected to a first expansion data-in circuit of the second switching module, and a first expansion data-out circuit of the second switching module is connected to a first expansion data-in circuit of the first switching module.
- [c9] The switching structure of claim 8, wherein the first receiver of each switching module is cross-connected to form a single receiver, and wherein the first output of each switching module is cross-connected to form a single output.
- [c10] A data transmission system comprising:  
a plurality of Local Area Networks interconnected by a hub including a plurality of LAN adapters respectively connected to said LANs and a

crossbar switch interconnecting all LAN adapters wherein at least one of said LANs transmits a plurality of data packets to another one of said LANs through said crossbar switch, and wherein said crossbar switch comprises at least two switching modules, said switching modules comprising:

- a first receiver which stores a first plurality of data packets;
- a second receiver which stores a second plurality of data packets;
- a first output which outputs a first subset of the first plurality of data packets and the second plurality of data packets;
- a second output which outputs a second subset of the first plurality of data packets; and
- a switch coupled to the first receiver and the second receiver and coupled to the first output and the second output for routing the first subset and the second subset to the respective first or second output.

[c11] The data transmission system of claim 10, wherein at least one of said LANs transmits a plurality of data frames to another one of said LANs through said crossbar switch, each frame comprising a plurality of data packets.

[c12] A method for routing a plurality of data packets in a data transmission system having a plurality of Local Area Networks interconnected by a hub including a plurality of LAN adapters respectively connected to said LANs and a crossbar switch comprising at least two switching modules wherein the first and second switching modules comprise a first receiver which stores a first plurality of data packets, a second receiver which stores a second plurality of data packets, a first output which outputs a first subset of the first plurality of data packets and the second plurality of data packets, a second output which outputs a second subset of the first plurality of data packets, and a switch coupled to the first receiver and the second receiver and coupled to the first output and the second output for routing the first subset and the second subset to the respective first or second output, the crossbar switch interconnecting all LAN adapters and wherein at least one of said LANs transmits a plurality of data packets to another one of said LANs through said crossbar switch, each of said data

packets having a fixed bytes size with one byte containing the respective final destination address, the method comprising the steps of:

receiving the plurality of data packets within the first switching module;  
comparing the final destination address of each of said data packets to a switch module address range of the first switching module; and  
storing the corresponding data packet into an internal memory of the first switching module for further outputting to the appropriate LAN adapter if the final destination address matches, or storing the corresponding data packet in an expansion memory of the first switching module for further routing to the second switching module.

[c13] The method of claim 12 further comprising a first step of assigning a switch module address range to each switching module.

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